

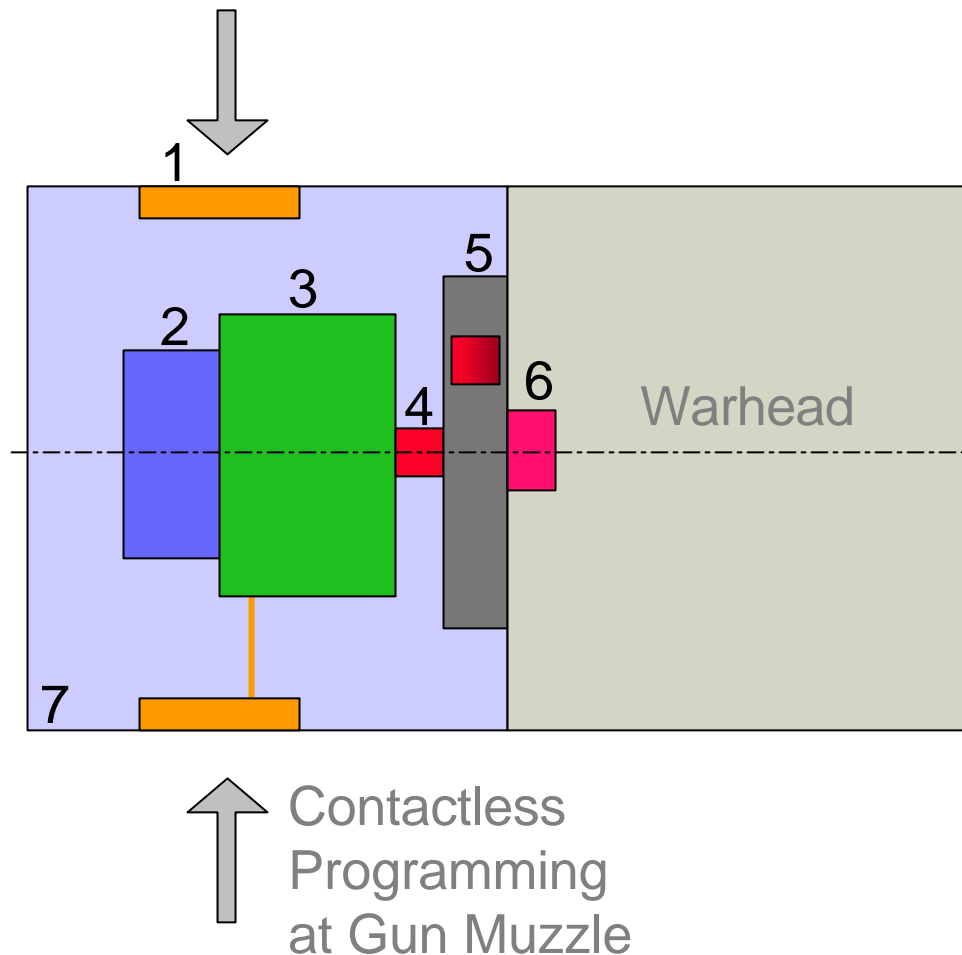


Air Bursting Munition ABM Medium Calibre Applications

Allan Buckley & Pierre Freymond
Oerlikon Contraves Pyrotec AG
CH-8050 Zurich / Switzerland
ocp-marketing@ocag.ch

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Abstract		
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ABM Fuze Components



Fuze Components:

1 Receiving Coil

2 Setback Generator

3 Electronic Timer
Module

4 Squib

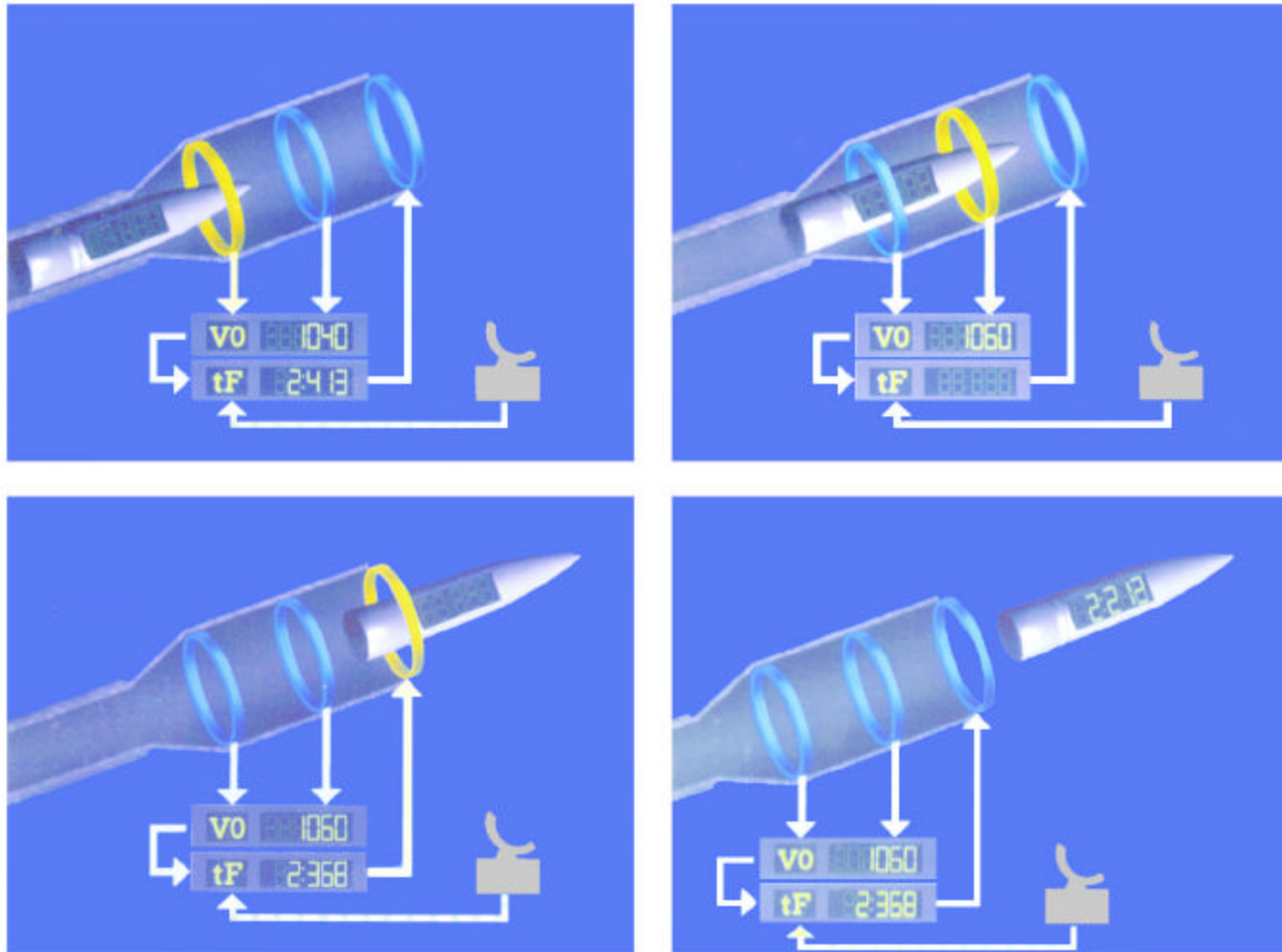
5 Safe & Arm

6 Booster, Ejection Charge

7 Base-Fuze Housing

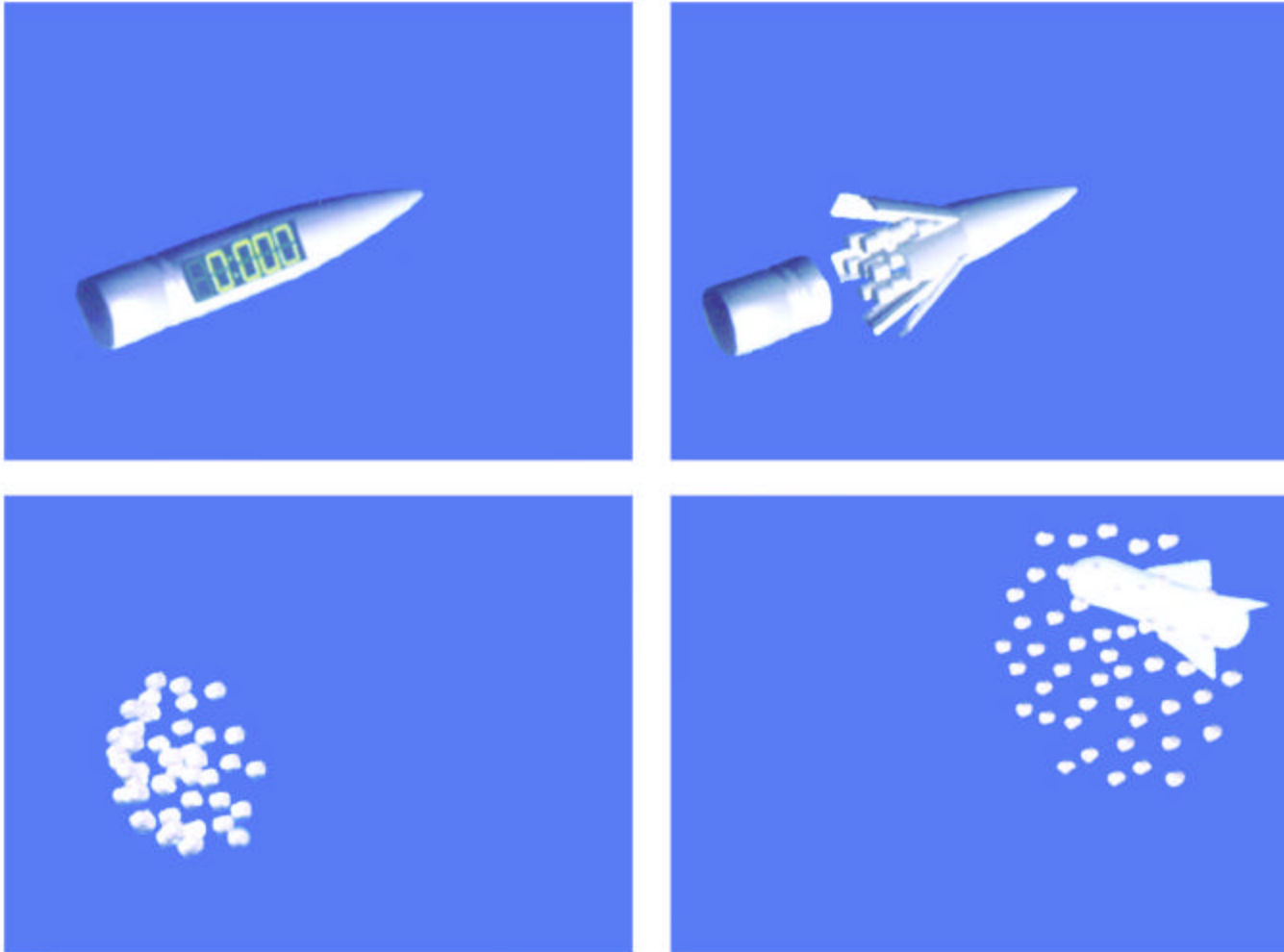


ABM Programming System With On-Line Compensation of MV-Variation



ABM KETF

Subprojectile Payload Delivery



Fuze Challenge!

Programmable Payload Delivery

Precise Time Space Payload Delivery up to 5000 rd/min!

10 Rds between 1200 m & 300 m
every 100 m!



10th Rd:
300 m

1st Rd:
1200 m



„String of Pearls“ at 550 Rd/min of 35mm Ahead-HETF Ammunition

Fuze Programming without & with Compensation of Muzzle Velocity Variation



7 Rd Burst 35mm Ahead-HETF Ammunition at 1600 m Range

ABM Family of Oerlikon Contraves

35mm x 228
Ahead
NATO Qual.



30mm x 173
selected for
AAAV - FCT

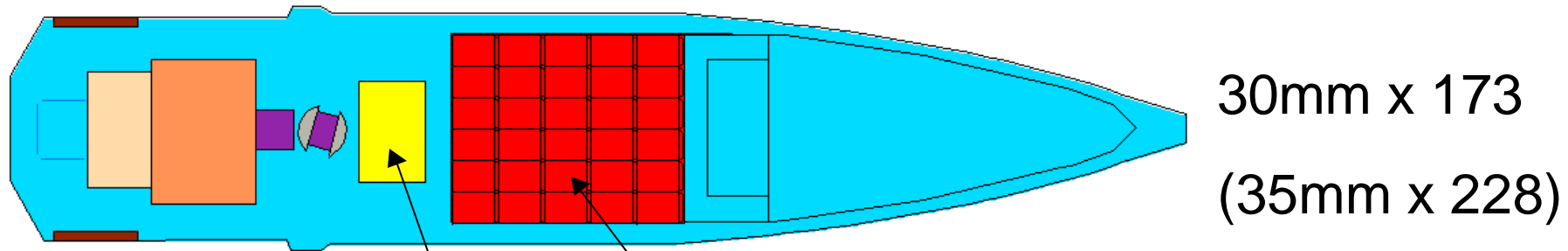


40mm x 53
selected in
Sweden for
evaluation



Other studies on
following calibers:
25mm x 137
27mm x 145
up to 140 mm

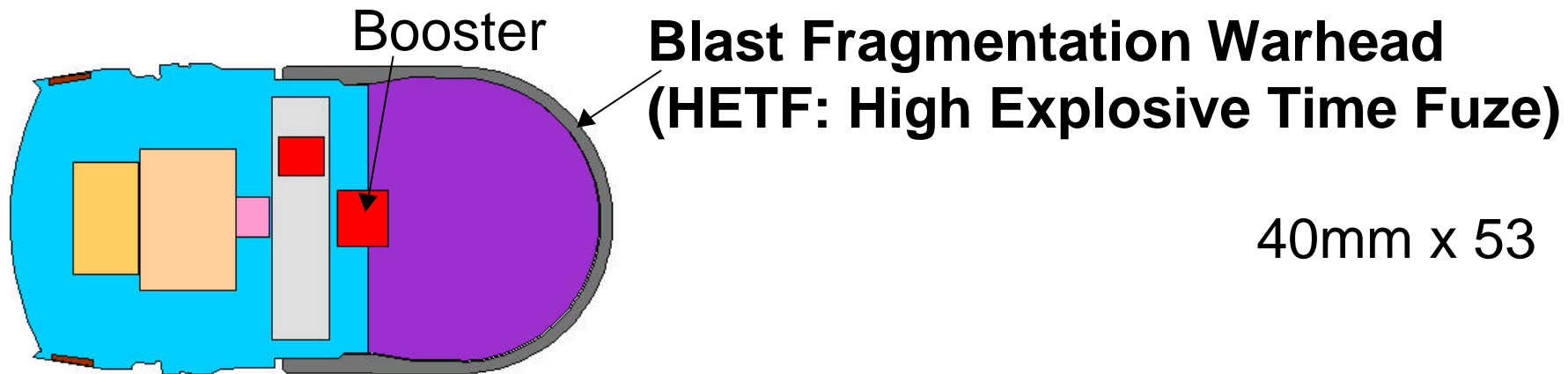
One ABM Fuze System (Ahead) - Two Different Warhead Systems



Ejection
Charge

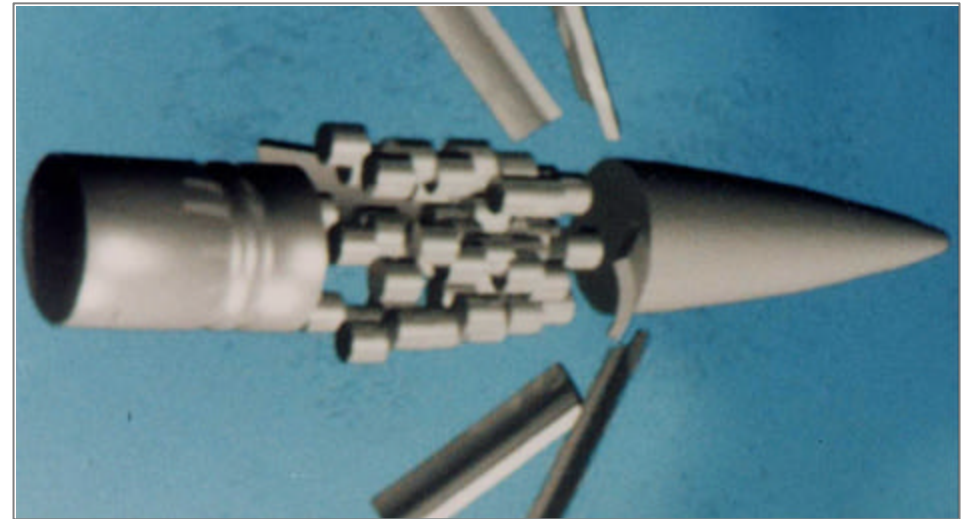
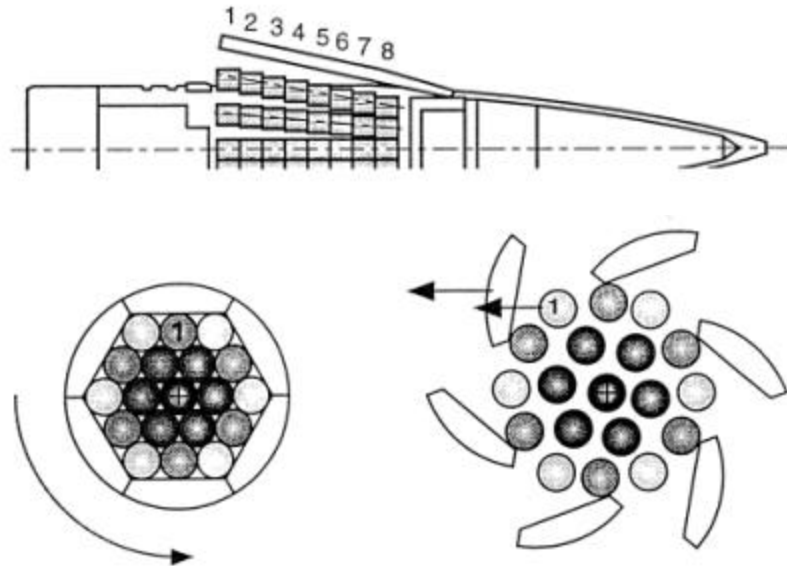
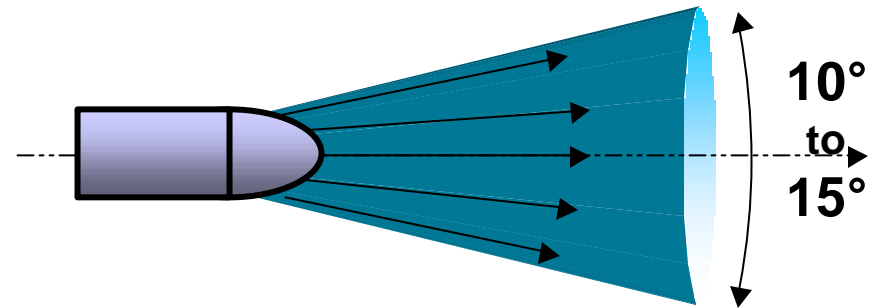
**Subprojectile Warhead
(KETF: Kinetic Energy Time Fuze)**

Programmable
Base Fuze



ABM KETF

Subprojectile Payload Ejection

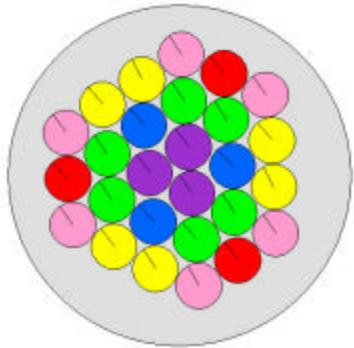
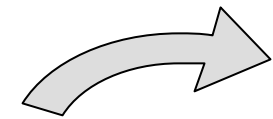


ABM KETF 30mm x 173

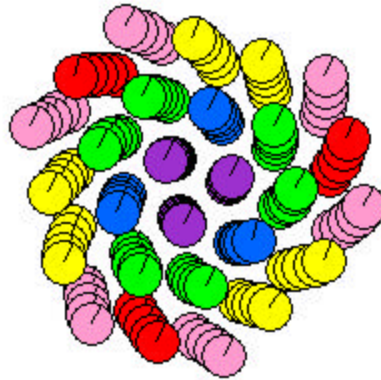
Payload Ejection Dynamics

135 Subprojectiles at 1.5 g each

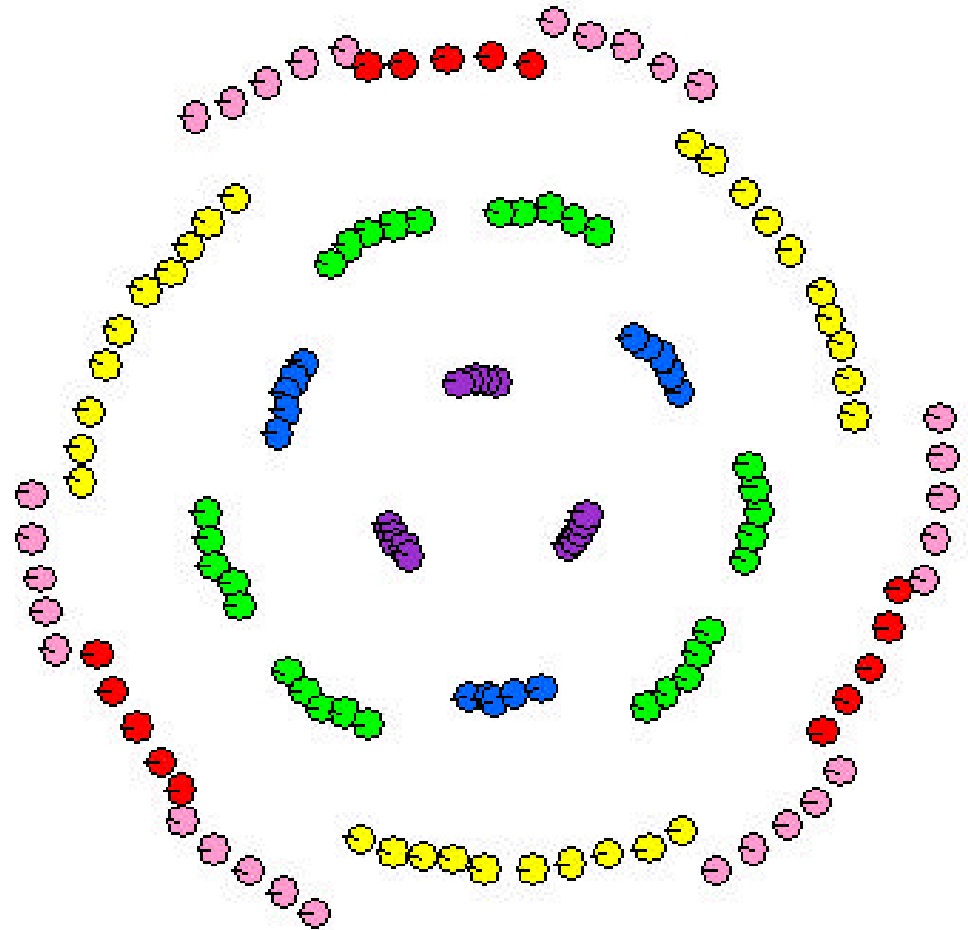
5 Layers at 27 Subprojectiles



Time: 0 μs



100 μs



500 μs

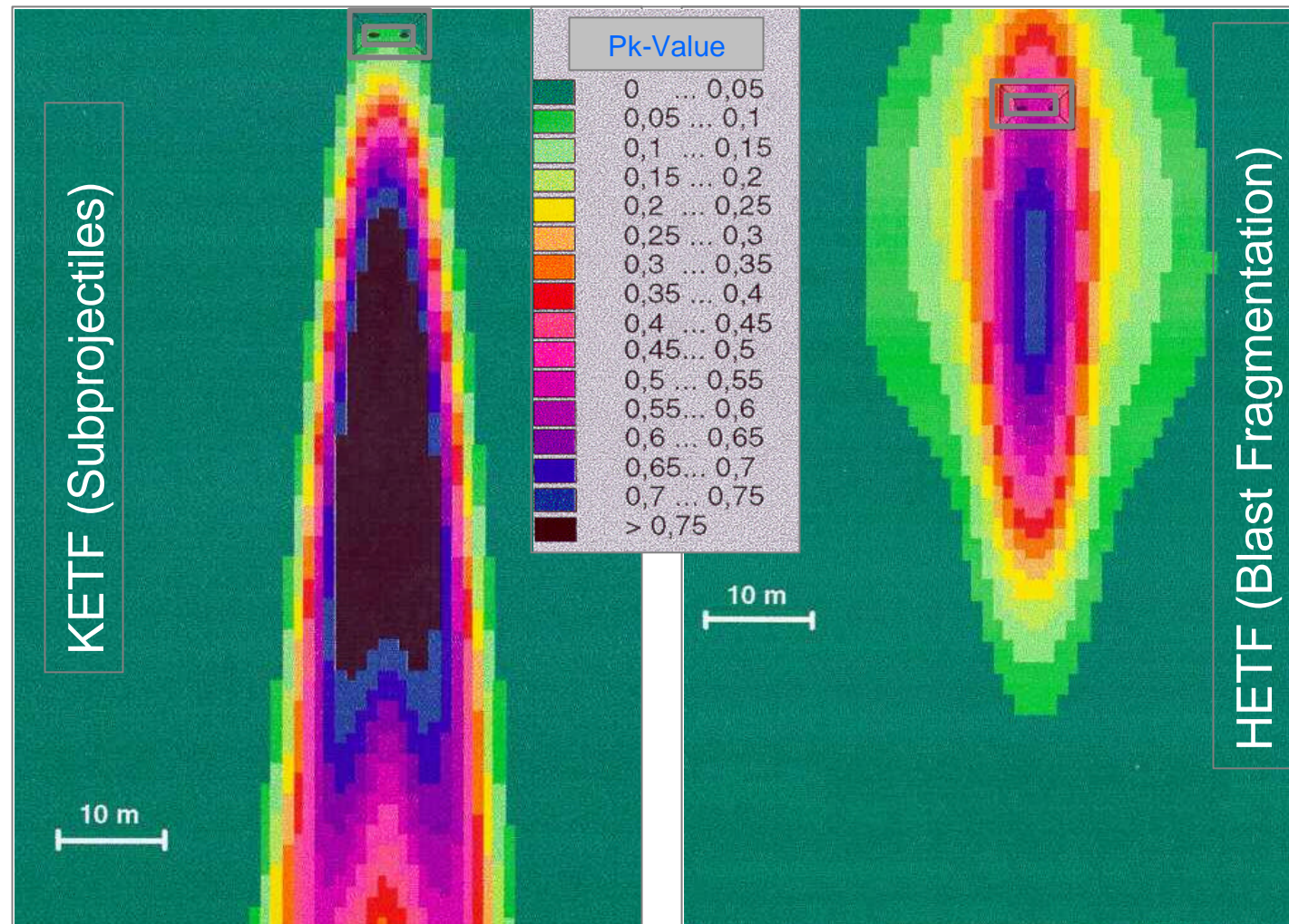
ABM KETF 30mm x 173 against ATGW-Bunker at 1 Km Range

Results: Numerous Full Perforations/100% Damage (Demo: Dec.1999)



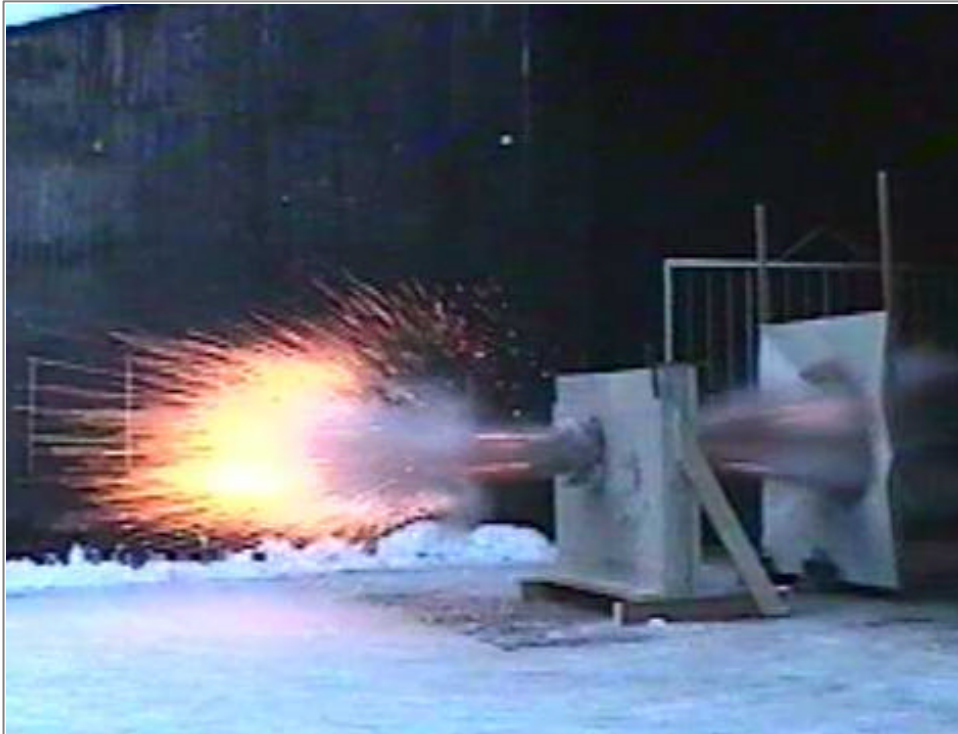
ABM (KETF & HETF) 35mm x 228 against ATGW-Bunker

Lethality of a
3 Rd Burst
against an
ATGW Bunker
at 1500 m



ABM KETF 30mm x 173 against Urban Target (Unprogrammed Fuze)

Target: 20 cm Concrete Wall with double Steel-Structure Reinforced
Results: Target Fully Penetrated



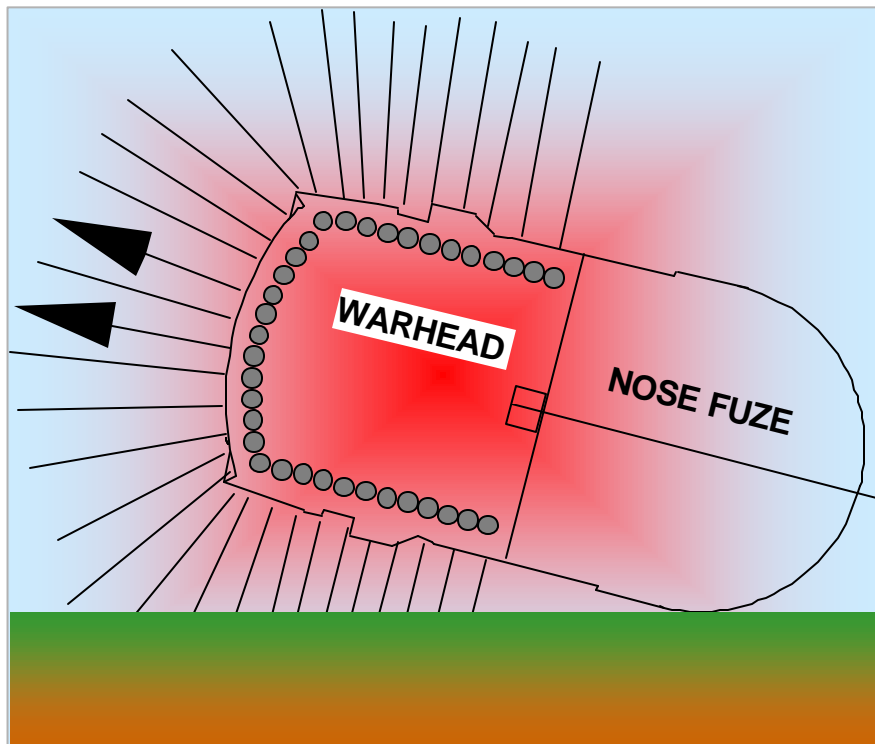
ABM KETF 35mm x 228 Ahead Simulated Lethality > 2 km Range

Target: Maverick Missile

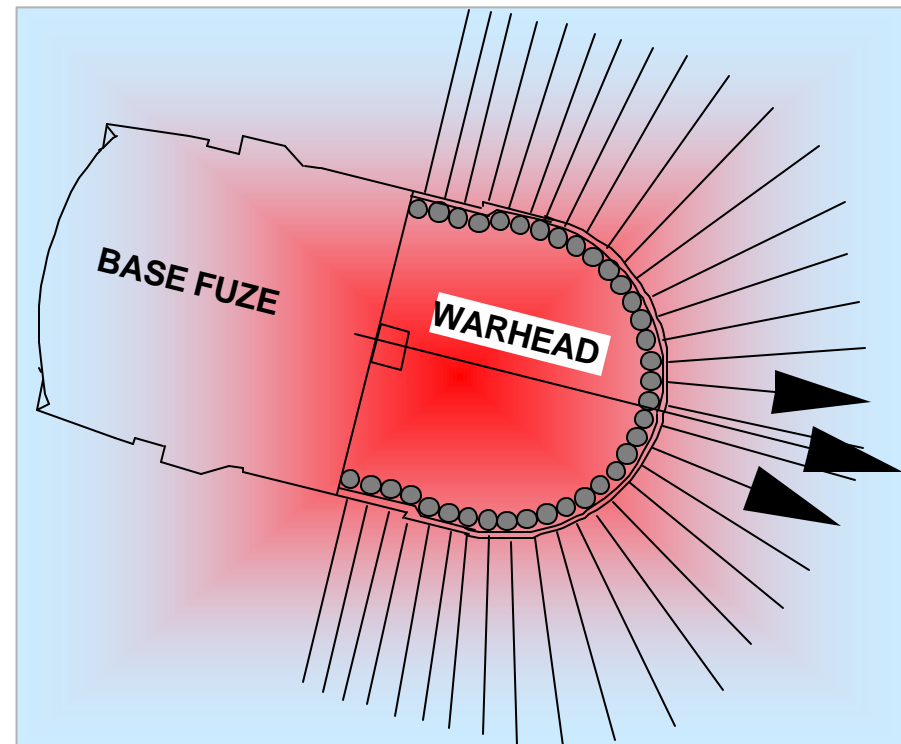


Subprojectile Graze Angle Impact < 10°

ABM HETF Basic Concept for 40mm x 53 Automatic Grenade Launcher AGL



Conventional HE Round
(PD-Fuze)



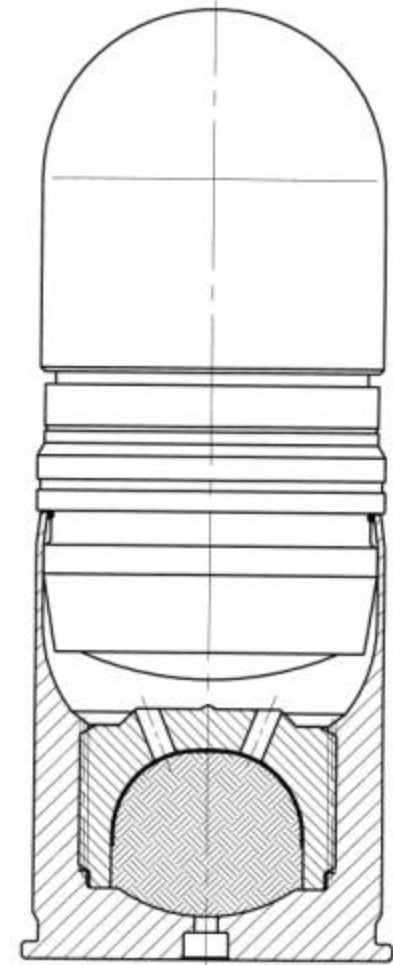
Optimum for
Air Burst Munition

TARGET

ABM HETF 40mm x 53 for AGL

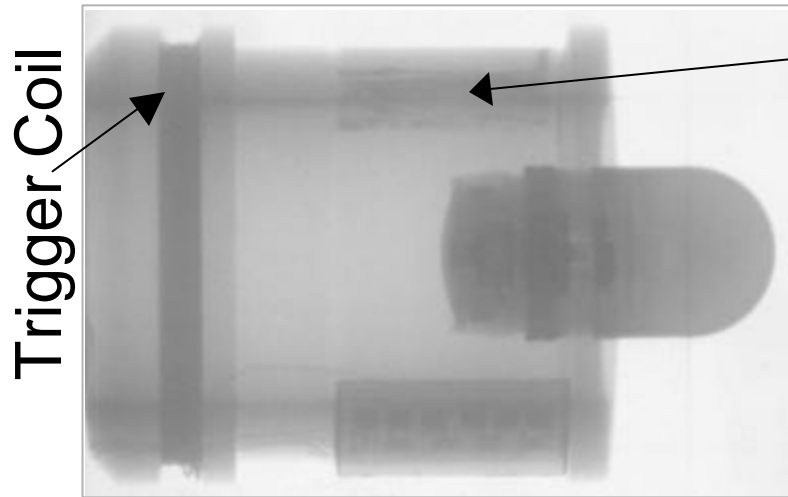
Round Parameters

• Round Length	max. 112 mm	
• Round Volume	approx. 130 cm ³	
• Round Mass	350 g	
• Projectile Mass	245 g	
• High Explosive Mass	> 35 g	
• Muzzle Velocity	245 m/s	
• Time of Flight	500 m	2.3 s
	1000 m	5.3 s
	1500 m	9.3 s
	2000 m	15.3 s



ABM HETF 40 mm x 53

Muzzle Programming Device

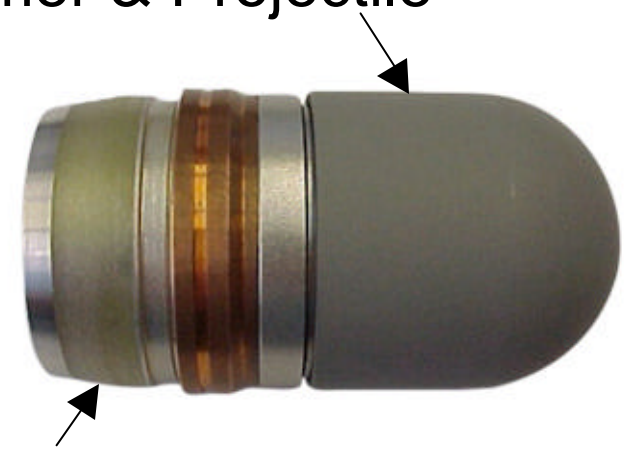
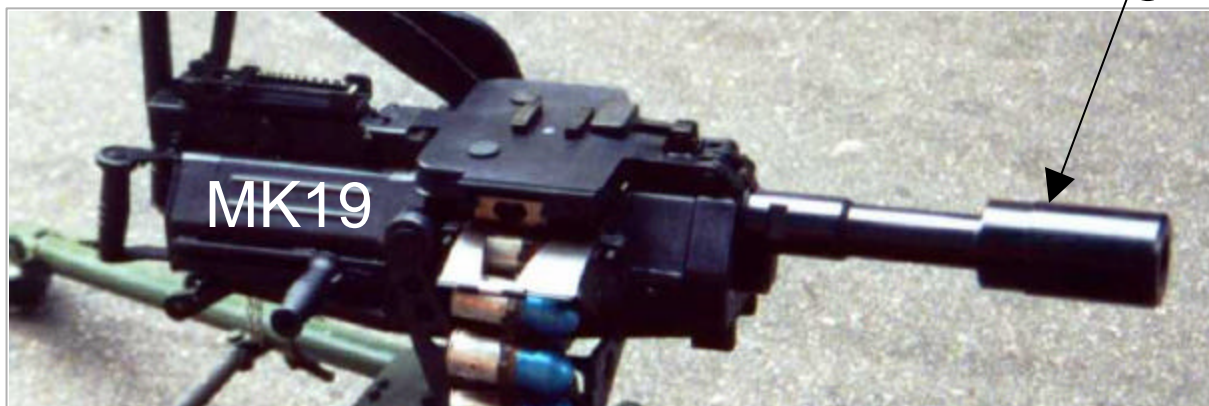


Programming Coil

Ammunition Programming Phase in
Muzzle Programming Device

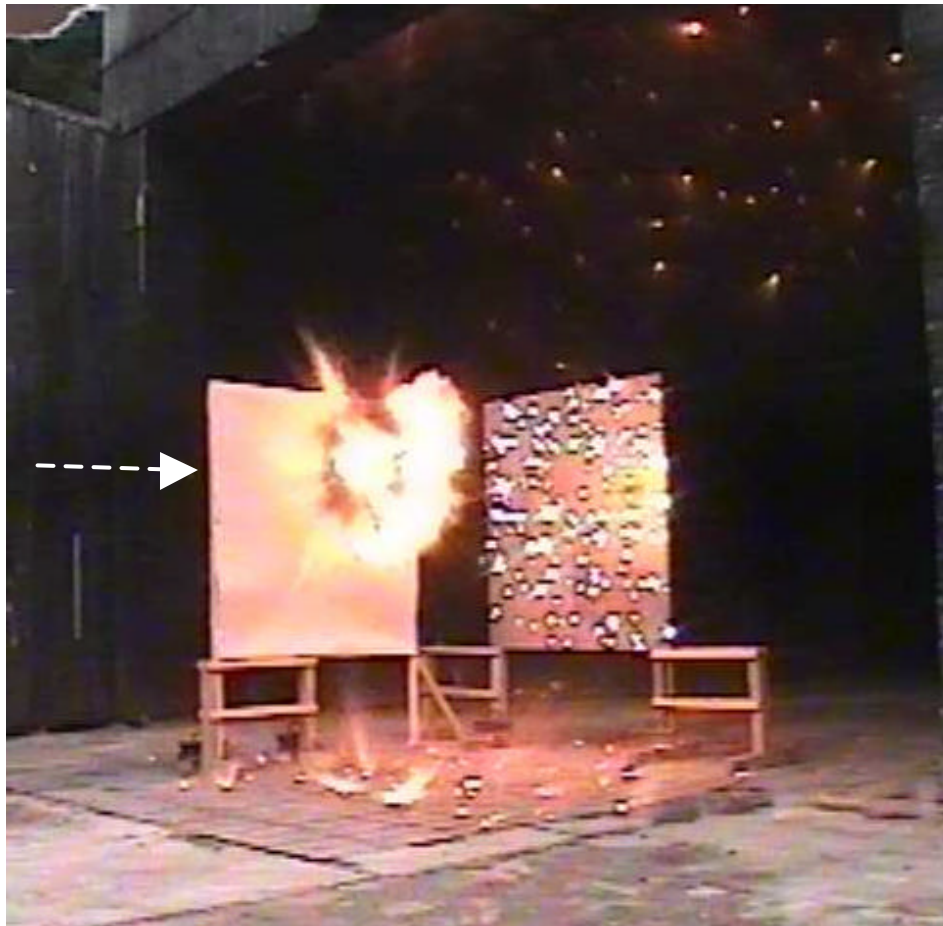
(X-Ray Picture)

Ammunition Programmer & Projectile



Receiving Coil

ABM HETF 40 mm x 53 Firing Trials



Range 200 m



3 Round Burst
at 570 Shot/min
(AGL of ST Kinetics)

Range 1000 m



ABM Fuze (Ahead): Main Features

- 1 Total modularity of components: easy manufacturing, testing & assembly
- 2 Autonomous power supply (no battery, no storage problems)
- 3 Allows rapid new fuze developments (recently: 30 mm x 173 & 40 mm x 53)
- 4 Fuze running time temperature compensated
- 5 Each bit programmed with double pulse
- 6 Completeness check on programmed message
- 7 Reliable component functions at very high g launch ($> 100'000$ g)
- 8 Absolutely ECM safe
- 9 Applicable to all calibers 25 mm upwards, rifled or smooth bore
- 10 High calculated system reliability ($> 97\%$) confirmed by years of experience



ABM System (Ahead): Main Advantages

- 1 Smart technology simple and safe in use
- 2 No rate of fire limitation due to fuze programming
- 3 Inductive fuze programming at muzzle (not in the gun)
- 4 On-line compensation for muzzle velocity variation
- 5 Easy system upgrade: no weapon modification
- 6 Absolute gun unload safety
- 7 Insensitive to mud, humidity & other environmental factors
- 8 Firing through bushes (impact sensor switched off)
- 9 If no fuze programming required, self-destruct automatically on
- 10 Lethality level of each round adjustable